

Normative Science¹

Robert T. Lackey²

National Health and Environmental Effects Research Laboratory
U.S. Environmental Protection Agency
Corvallis, Oregon 97333

lackey.robert@epa.gov
(541) 754-4607

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²Dr. Lackey, senior fisheries biologist, is with the U.S. Environmental Protection Agency in Corvallis, Oregon (lackey.robert@epa.gov; 541-754-4607). He is also courtesy professor of fisheries science and adjunct professor of political science at Oregon State University.

I am concerned that we are heading down a path in fisheries science that risks marginalizing science, if not much of our scientific enterprise. Many of us who provide scientific information to decision-makers and the public should become more vigilant, more precise, more demanding, and more rigorous in distinguishing between *policy-neutral* and *policy-inculcated* scientific information.

Let me be explicit about two key points concerning the role of scientists in fisheries policy.

First, fisheries scientists *should* contribute to policy analysis. Not only is it the right thing to do, we are obligated to do so. I do not hold with the notion that it is sufficient for scientists to publish their findings solely as scholarly reports.

Second, when scientists contribute to policy analysis, they need to exercise great care to play an appropriate and clearly defined role. Here is where the interface between science and policy gets muddled for many fisheries scientists.

Exactly what is an appropriate role and how do we tell when we are off track? Our role is not described adequately under the current rubric of providing the so-called “best available science.” Further, scientists are often asked to contribute to help resolve fisheries policy issues that are unfolding amidst a complex, volatile mix of clashing values, differing preferences, and opposing, often mutually exclusive, societal priorities.

These days, one commonly asserted imperfection in the science-policy interface is that some so-called “science” is imbued with policy preferences. Such science may be labeled as *normative* and it is potentially an insidious kind of scientific corruption. By normative science, I mean “*information that is developed, presented, or interpreted based on an assumed, usually unstated, preference for a particular policy or class of policy choices.*” In some forms, normative science is not obviously normative to policy makers or even to many scientists. Such “science” has become a serious problem. I believe that use of normative science is stealth policy advocacy.

Science, of course, is not value-free because it is a human enterprise, but this fact does not make all science normative. Policy-neutral science is a way of learning about the world and it is characterized by transparency, reproducibility, and independence.

Consider the simple but fundamental difference between scientific “is” and the policy “ought.” Science deals with the “is” world (and the “was” and “will be” states of the world) as does the policy world, but the policy world also deals with the “oughts” and “shoulds.” Science is, or should be, bounded in the “is” world.

Let me be specific with an example: many dams have a considerable effect on salmon populations in the Pacific Northwest. One oft-debated option to help restore salmon runs is to breach dams.

Scientists can assess, at least with a degree of confidence, the likely effects of removing, or preserving, a particular dam or set of dams, but there is no scientific imperative to remove, or maintain, any dam for any ecological reason, including salmon recovery. Of course, there are ecological consequences of each policy option and those consequences may even be catastrophic from a salmon perspective, but ecological consequences are simply one element that the public and decision-makers must weigh in making a policy choice. Understanding different ecological outcomes is what the public and decision makers need from scientists as they weigh policy alternatives, not our personal opinions on which policy option they ought to choose.

How should scientists explain to the public and decision makers the relevant scientific information pertaining to the likely effects of dam construction or removal? There are obviously many ecological changes that will take place but what words should be used? What point of ecological reference should be used, if any? Should benchmarks of any kind be used?

Often I hear or read words like “degradation.” Or words like “improvement.” Or “good” or “poor.” Do not use these in conveying scientific information. Using such words implies a preferred ecological state, a desired condition, a benchmark, a preferred class of policy options. This is not science, it is policy advocacy. Subtle, perhaps unintentional, but still policy advocacy.

The appropriate “science” words are ones such as “alteration” or “change” or “increase” or “decrease.” These words describe the scientific information in ways that are policy-neutral. In short, they convey no policy preference and convey science in a policy-neutral manner. Be clear, be candid, be brutally frank, but be policy-neutral.

Conversely, normative science by its very nature conveys an implied policy preference. Often among some fisheries scientists, the implicit policy preference is that unaltered ecosystems are inherently “good,” or at least preferable to altered ecosystems. Unstated, but implied: the less altered, the better. But science leads us to no preferred state, nor to any inherently “good” condition. In short, there is no scientific imperative for adopting any policy option.

How widespread is normative science in fisheries science? It is prevalent and insidious!

How often do you hear biological diversity measured solely based on native species? Usually! Except for someone doing truly basic research, the decision to include, or exclude, exotic species is a policy choice, not a choice for scientists to make. That is not to say the native species and exotic species are interchangeable; they are not, but neither native species nor exotic species are inherently preferable in a scientific sense.

What about professional societies and other organizations that assert that biological diversity is inherently good? Biological diversity might well be inherently important in understanding ecosystem structure and function, but you must invoke a value judgment to define biological diversity as inherently good or that high biodiversity is preferable, policy-wise, to low biodiversity.

What about the widespread use of “ecosystem health?” Normative science! Ecosystem health is a value-driven policy construct, but it is often passed off as science to unsuspecting policy makers and the public. Sometimes, scientists who employ the notion of ecosystem health will hide behind a cloak of scholarly deniability: “We analyzed the data using a precise definition of ecosystem health but others misused or misinterpreted the results. We cannot be responsible for how others use the results.” Think what the average recipient of scientific information actually *hears* when data or assessments are packaged or presented under the rubric of ecosystem health. Healthy is good.

One person’s “damaged” ecosystem is another person’s “improved” ecosystem. A “healthy” ecosystem can be either a malarial infested swamp or the same land converted to an intensively managed rice paddy. Neither condition can be seen as “healthy” except through the lens of an individual’s values and policy preferences.

Should a healthy ecosystem be defined as the ecological state that existed at the beginning of the Holocene, just prior to 1492, or at the end of last week? The answer is a value judgment, a policy choice, the product of political deliberations, not a scientific decision. Certainly scientists should assess the feasibility and ecological consequences of achieving each possible policy or management goal, but the choice is a societal one.

Politically, from what I observe, the use of normative science cuts across the ideological spectrum. It seems no less common on the political Left or the Right, nor from the Greens nor from the Libertarians.

Fair or not, it is true that scientists, at least as perceived by many people, are just another political advocacy group arguing for, or against, ratifying Kyoto, the Biodiversity Convention, or arguing in favor of, or against, marine protected areas. Just another political advocacy group signing petitions to remove, or preserve, a particular salmon-killing dam, and all for reasons that sound like science, read like science, are presented by people who cloak themselves in the accouterments of science, but who are actually offering nothing but policy or political advocacy masquerading as science.

We should develop within our profession a clear understanding of the interface between science and policy, as well as an understanding of the appropriate roles for science, scientists, and public and personal values and policy preferences.

To policy makers, I say: be alert. Scientific information is too important to the successful resolution of important, divisive, and controversial fisheries issues to allow some scientists to marginalize science through its misuse. Do not allow the overzealous among us to corrupt the entire scientific enterprise.

To scientists, I say: get involved. Play the proper role, the appropriate role, but know and announce when you have stepped out of a scientific role and into the role of political advocate. Science has much to offer, but also has much to lose by doing otherwise.

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Abstract

Effectively resolving the typical fisheries policy issue requires providing an array of scientific information to decision-makers. In my experience, the ability of scientists (and scientific information) to constructively inform fisheries policy deliberations has been diminished when what is offered as "science" is inculcated with policy preferences. As with all human activity, the scientific enterprise is not free of values, nor is it objectively independent, but values reflected in subtle form as policy preferences should not be permitted to prejudice scientific information. Scientific information becomes "normative" when it contains tacit policy preferences and thus, by extension, promotes particular policy options. There are many examples of normative science corrupting the development of sound fisheries policy by operating under the guise of policy-neutral science. In fact, with its tacitly derived value and preference character, normative science provides little substantive help in reconciling the most divisive elements of fisheries policy. In my opinion, scientists should play the important role of "informing" fisheries policy discussions with unbiased, understandable scientific information, assessments, and forecasts. For developing sound fisheries policy, science is important, helpful, even essential, but involvement with policy issues by a naive scientist can lead to loss of credibility and perceived independence unless the proper roles of both science and policy are understood and followed.

Author's Biography:

Dr. Robert T. Lackey, senior fisheries biologist at the U.S. Environmental Protection Agency's research laboratory in Corvallis, Oregon, is also courtesy professor of fisheries science and adjunct professor of political science at Oregon State University. Since his first fisheries job 40 years ago mucking out raceways in a Sierra Nevada trout hatchery, he has dealt with a range of natural resource issues from positions in government and academia. His professional work has involved all areas of natural resource management and the interface between science and public policy. He has written 100 scientific and technical journal articles. His current professional focus is providing policy-relevant science to help inform ongoing salmon policy discussions. Dr. Lackey also has long been active in natural resources education, having taught at five North American universities. He continues to regularly teach a graduate course in ecological policy at Oregon State University and was a 1999-2000 Fulbright Scholar at the University of Northern British Columbia. A Canadian by birth, Dr. Lackey holds a Doctor of Philosophy degree in Fisheries and Wildlife Science from Colorado State University, where he was selected as the 2001 Honored Alumnus from the College of Natural Resources. He is a Certified Fisheries Scientist and a Fellow in the American Institute of Fishery Research Biologists.
